



The Blurb



Newsletter of The Phil-Mont Mobile Radio Club

63 Years of Public Service, 1949 to 2012

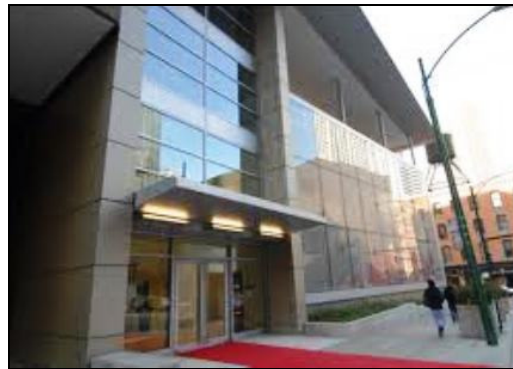
Volume 62 Number 8

www.phil-mont.org

August 2012

National Radio Day

August 20th



**Museum of Broadcast Communications
Chicago, Illinois**

MS150 can use more help at the end of September,
contact Carmen KE3QB for details

<i>The Blurb</i> is published monthly by and for the members of The PHIL-MONT MOBILE RADIO CLUB, Inc., whose purpose is to promote Amateur Radio in general, and Mobile Radio in particular. Copying and quoting is permitted with a credit line. We gladly exchange publications with other amateur radio clubs. Requests should be sent to the Editor. Subscriptions are available to non-members for \$12, addressed to the Treasurer. Editor: Rick DeVirgiliis ND3B nd3b@arrl.net 215-908-7225 Labels and mailing: KB3IV Submissions deadline: All copy must be in the hands of the Editor by the 20th of the previous month.		Directors: WU3I (12) W3MHP(12) KB3SJS(12) WA3KIO(13) N3QV(13) ND3B(13) KB3IV(A)	Contact Phil-Mont: P.O. Box 88 Abington, PA 19001 http://www.phil-mont.org Website: Eric N3QV & Andrew KC2PMW For club information: Contact any club officer, or the repeaters listed below. Address or club directory changes and articles for the membership e-mail list should be sent to: KB3IV
		Sunday Morning Net Schedules • 2 Meter/ 70cm Net..... at 0930L on W3QV repeater • 10-on-10 Net at 1000L 28.393 MHz USB (±QRM) • 75 meter Net at 1020L 3.993 MHz LSB • ARES at 2100L on the W3QV repeater	
Committees Audit: NS3K Blurb folding: KB3IV & N3GLU Directory: KB3IV	DX: N3MT Emerg.Coor: K3HWE Field Day: KE3QB Internet: N3QV & KC2PMW Membership: N3XKE	Net Control: KB3IV Publicity: W3RM Program: Club VP Public Service: KE3QB Refreshments: W3AOK Repeater: W3AOK	Scholarship: W3RM Skywarn: WX3PHI Sunshine: N3GLU VE Program: NS3K Welcome: N3UBY Youth: KC2PMW

All visitors are welcome!

The club meets at 7:30 PM on the *second* non-holiday Wednesday each month except July and August at **Roxborough Memorial Hospital, 5800 Ridge Avenue, Philadelphia, PA 19128**
Maps and directions are available at www.phil-mont.org.

License Examinations are held on the fourth **non-holiday Thursday** each month at **Community Ambulance Association, 1414 E. Butler Pike, Ambler PA 19002**

Registration begins at 7:00 P.M. Applicants should contact Jim McCloskey NS3K at 215-275-2979 or jmccloskey@msn.com for the latest information.

Club Stations W3QV/R: The Jim Spencer Memorial Repeater System

Ridge & Port Royal Avenues, Philadelphia, PA **Trustee: W3RM**

147.03 MHz + PL 91.5 Hz 444.80 MHz + PL 186.2 Hz

Reach us on EchoLink through W3QV-R

W3AA Trustee: WU3I

W3EM: Field Day/special event station Trustee: N3QV

The Officers

Pres: KB2ERL Bob Nicotera bnic1903@msn.com

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Treas: W3RM Richard A. Moll roger.mike@verizon.net

Asst. Treas: N3MT Michael P. Taraborrelli michaelmt_1999@yahoo.com

The Prez Sez ...

If these are the dog days of summer then it's time someone threw us a bone. Being one who works in it every day, the heat has been tough on me this year. They say last summer was hotter but I find that hard to believe considering the temps we've had. I think that the power companies are going to be reporting profits not unlike the oil companies. On a better note I hope everyone is enjoying the summer so far; I for one am looking forward to my vacation at the end of the month both at Ocean City, NJ and Ocean City MD. When September comes we'll all get back to business such as kids back to school and Phil-Mont meetings etc etc etc. Don't forget the big event at the end of September the MS150 city to shore bike tour; for some of our new members it's a good chance to break into public service events. Not only is it a great time, if you get your application back in time you get a free room in Ocean City Saturday night. So just like the Marines Carmen KE3QB and the MS society are looking for a few good men and women.

So till next month stay cool, stay well and keep communicating!

73, Bob KB2ERL

From the Secretary...

will resume in October

(There were no meetings in July.)

***Phil-Mont
Birthdays & Tidbytes***

August Birthdays

01 Ralph Germanotta – K3FXR

02 Tom Bohlander - WA3KLR

05 Fred Uebelhoeer - KA3IRJ

09 Carolyn Popovic - KA3VLJ

14 Lucille Gargano (XYL N3YGY)

Patricia MacKenzie (XYL W3RED)

18 Norma Coupe (XYL WA3BXH)

19 Donna Lynn Larkin - WA1WYQ (XYL KA2FFP)

20 Keiko Simon – KB3SJT

23 Ray Kiesel - K3RIZ

30 Vincent Buono - WA3ADI

MEMBERSHIP STATS

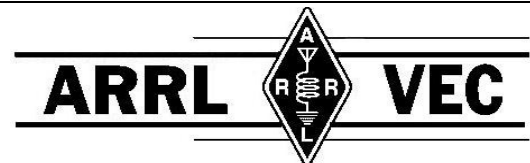
At press time P.M.R.C. has:

83 FULL PAID MEMBERS

10 FAMILY MEMBERS

3 YOUTH MEMBERS

1 HONORARY MEMBERS



***The VE evening session is on Thursday the
23rd this month.***

As always, many thanks to our VE team!



Professor Bob, W3NE

THIS AND THAT
Miscellaneous Ramblings
Bob Thomas, W3NE

THE MAGNETIC LOOP ANTENNA
A Magic (almost) aerial

Some hams are hobbled by a local noise level so high that only signals S8 and stronger are able to blast through the background cacophony for pleasurable reception. Believe it, I'm one of them, and from what we hear on the air I'm not the only one! Even some who have a beam or "ideal" wire antenna, high and in the clear, experience noise from a nearby commercial district or distant power line fault like a leaking circuit breaker a mile or more away. Others are afflicted by strictly local (in-house) noise sources but do not have the real estate to erect a half-wave wire between 80 foot poles in an open field, as antenna manuals so glibly suggest; that's me too. Still others are severely limited by restrictions on outdoor antennas. In short, many radio amateurs have been struggling in a severe noise environment with little possibility for acceptable receiving conditions. That situation might be improved with an antenna based on principles developed 46 years ago but only recently incorporated in a commercial product.

In the early 1960s, at the height of the Cold War with the USSR it became vitally important for the U.S to detect the EMP (Electro-Magnetic Pulse) that accompanies the explosion of an atomic bomb.

While an EMP is incredibly destructive to electronic equipment in certain circumstances it also can be quite weak when it emanates from an underground explosion or detonation of a small device at a considerable distance. The latter situation required sensing apparatus relatively immune to local noise sources in order to detect a weak EMP. Furthermore, it was crucial not only to detect weak EMPs, but to localize their source based on bearings at the receive location. First Lieutenant Carl E. Baum, of the Air Force Weapons Laboratory, made a rigorous mathematical analysis of loop antennas to determine the best approach.

Lt. Baum's 1964 study compared conventional split-shielded loops having a long history of success in radio direction finding, against a relatively unknown type called a *Mobius Strip Loop*. What Baum's analysis revealed was that a Mobius loop antenna has twice the sensitivity to the *magnetic* field of an electromagnetic (radio) wave as a conventional shielded loop while simultaneously exhibiting lower sensitivity to the *electric* component of the wave. Those two characteristics of a Mobius "magnetic" loop make it an ideal receiving antenna because its superior sensitivity to the magnetic field of desired signals and its insensitivity to the electric field, which is predominantly associated with local "man-made" noise. In short, a Mobius loop antenna enhances the signal-to-noise ratio of desired signals. Baum's insightful analysis was not declassified for release to the public until 1994.

Let's look into what a *Mobius* really is. It is a German term (pronounced "mee-bus") describing an object that has only one surface and one edge. That might seem impossible but an easily made example reveals exactly what a Mobius is: Take a strip of paper, say 1/2" wide and a 10" long, give it a half-twist, then paste the two ends together. The strip now fulfills the two-part definition of a Mobius. If you don't believe it, start at the joint in the strip and run a finger along an edge. After traversing the edge for its entire 20-inch length you come right back where you started without going around any corners, proving there is only *one* edge.

Similarly, starting at the joint, run a finger along the surface and you will travel over the full surface of

the strip to come back where you started; your Mobius strip has only *one* surface!

A Mobius strip loop antenna is constructed inside a tube typically formed into a circle with an opening at the bottom. Individual coaxes are threaded through each half of the loop from bottom to top, where the center conductor of each coax is connected to the shield of the other coax, forming a *Mobius* circuit in which there is a single continuous path through center conductors and shields of both coaxes. That Mobius configuration endows loops with twice the sensitivity of a conventional loop. The coaxes are completely insulated from the tube and the tube does not have a gap at the top like many loop antennas. Received signals are extracted from the center conductors of each coax at the bottom of the loop.

Compact loop antennas unfortunately suffer from the disadvantage of their small physical size compared to the wavelength of signals they are receiving so they intercept less energy and produce lower signal levels than conventional full-size antennas with large apertures. Another limitation of Mobius loops results from response primarily to the magnetic field of signals, which is only one-fifth the amplitude of the electric field picked up by a wire antenna mainly picks up. Those effects cause the output of a magnetic loop to be much lower than conventional aerials but they discriminate against noise and the lower output level can be easily compensated by a high gain amplifier between the loop and receiver.

A useful characteristic of a Mobius loop is its figure-8 sensitivity pattern which exhibits maximum pickup in-line with the plane of the loop, and nulls broadside to the loop. The shape of its pattern is similar to a half-wave wire but since loops are small they can be easily rotated to take advantage of their directivity. Thus a loop can be turned to peak a desired signal or, alternatively to null interference. Noise sources at W3NE are

nearby and diffuse so the loop's null seldom helps here, but when a station is bothered by a concentrated distant noise, like that utility company

leaking lightning arrestor, it might be more beneficial to overall SNR to null the noise rather than peak the desired signal.



Lt. Baum's findings are the basis for Pixel Technologies' RF PRO-1 Magnetic Loop, introduced in 2010 and subsequently upgraded to current version -1B. Some PMRC members have this loop including W3AOK, K3RIZ, NC3U and the writer. It covers the entire range from 50 kHz to 30 MHz. The Pixel loop is made of two semi-circles of $\frac{3}{4}$ " aluminum tube connected to conduit junction boxes at top and bottom, where internal connections are made. An aluminum plate bolted to the bottom conduit box supports a rugged diecast preamp housing and has holes for mounting the loop on a mast with supplied U-bolts. I was concerned about the loop's wind velocity rating in case the owner of my apartment made an issue of it. When the question was e-mailed to Doug Talley, an affable fellow who seems to be the knowledgeable Chief Cook & Bottle Washer at Pixel he replied, "The loop is very conservatively rated at 100 mph." Well-l-l-l, maybe, but in any case it is mechanically robust.

As previously discussed, the output level from a loop is substantially lower than most antennas. To compensate for its low output the PRO-1B package includes a 37 dB broadband low noise preamplifier. Even so, signal levels at the W3NE receiver are at least two S-units lower than a "normal" antenna, but that does not seem to cause any detrimental effects. Preamp output from an F connector goes through

RG-6U Quad-Shield coax to a junction box inside the shack. The junction box incorporates connectors for: 1) coax feed from the antenna; 2) coax to a receiver or transceiver; 3) 20 volts d-c from a supplied wall wart for preamp power, which is multiplexed on the preamp transmission line; and 4) T/R logic level input from the transceiver or station

T/R control system to disable the preamp when transmitting.

The PRO-1B is a receive only antenna that requires special precautions to avoid damage from high level RF during transmissions. These are all spelled out in the User Manual (available on-line) but in general, unless the loop is used with a transceiver having a dedicated Receive-Only Input, some means for external rapid T/R antenna switching has to be provided. Even with a dedicated Rx Input, the transceiver must supply a ground-on-transmit T/R control signal (the same as for linear amplifier control) to an RCA jack on the antenna junction box for disabling the preamp. If a dedicated Rx-Only Input is not available, or if the PRO-1B is used with a standalone transmitter, a fast antenna T/R switch or relay has to be provided. The DX Engineering RTR-1 supplies all the functions to do that with safety interlocks in a compact unit that also enables easy comparison of incoming signals from the loop or main antenna.

The PRO-1B can be mounted in a fixed position but it has to be rotatable for optimal performance to peak desired signals or null interference. There is a difference in signal strength of about three S-units on 40 meters depending on loop orientation; the same should apply to nulling noise if it is coming from a distance. One illustration here shows the rotator installation at W3NE (transmissions are from a Hamstick dipole visible at the center of that photo). The other photo is a view of the loop high above my third floor balcony; the preamp is in the box directly below the loop. I get a two to three S-unit improvement in SNR with this loop compared to any other antenna tried. Anyone interested in performance of the PRO-1B should check user

reviews posted on eHam.com reporting performance in a wide variety of installations.



While the Mobius Magnetic Loop isn't a "magic" antenna, it might be the best way for some hams to cope with a high-noise environment or space constraints.

Have you heard about D-Star?

Philadelphia Digital Radio Assn meets the first non-holiday Monday of each month at the Community Ambulance Assn 1440 East Butler Pike Ambler, Pa. 19002 at 7:00 pm.

The club has two D-star repeaters on the following frequencies: On two meters - 146.61 (-) and on 70 cm 445.18125 (-)

I run a weekly club D-star net on Mondays at 8:00 pm local time on the club 2 meter frequency.

de Jim, NS3K



*Below is July's **Prez Sez** column which apparently got lost in the interweb ether enroute to Blurb H.Q.*

Personally I believe it's part of the cats' diabolical plot to take over the world.

Well here we are at the half way point of the summer. We just finished another fun and successful Field Day operation. Ed KB3IV sent an email to the weather gods and apparently they responded and sent us a great weekend. Unfortunately the band gods were not as helpful as the bands were not in as good a shape as we wanted. Carmen KE3QB myself and Ralphie K3FXR did pretty well on 75 meters, Dick W3RM did well on 40 meters cw, but the other bands were not as cooperative. But all in all everyone there had fun and ate well to boot. Our thanks go out to everyone who helped to put together another great Phil-Mont field day weekend. Also thanks to Steve WU3I for keeping up on his culinary skills and keeping us well fed all weekend.

On the next note congratulations are in order both of our Phil-Mont scholarship winners Caitlin Brady W3CJB and Andrew Furlong KC2PMW. Once again congratulations and keep up the good work. Finally, I hope everyone is enjoying their summer and having good times, the next time we get together will be the September meeting. Please keep in mind the MS 150 is the end of September and we could really use some more help. Til then Good Weather, Calm Seas, and Clear Airwaves.

73 de Bob, KB2ERL

Two full moons in August!

According to the Farmer's Almanac the Sturgeon moon is on the 1st and the Blue moon is on the 31st

Check out this rope for your antenna project –

3/32" Braided Olive Drab - Dacron / Polyester cord

This is a high quality braided polyester cord with a breaking strength of 210 pounds. Proudly Made in the U.S.A.!

This is a gorgeous solid braid perfect for dipole antennas. Very low stretch and strong. Will withstand the weather & sun for 7 to 10 years.

***PRICE \$10.00 PER 100 FEET
SOLD IN 100 FOOT LOTS
CONTACT STEVE WU3I AT
WU3I@ARRL.NET***



Newfangled transistor radio

August at Phil-Mont

There are no meetings in July or August

5th Sun KC2PMW NCS
 12th Sun W3STW NCS
 13th Mon Lefties Day
 15th Wed National Relaxation Day
 16th Thurs Roller Coaster Day
 19th Sun KB3IV NCS
 20th Mon National Radio Day
 23rd Thurs VE test session
 26th Sun N3OWM NCS

***Don't forget the ARES net on Sunday nights and
 the Digital net on Tuesday nights.***

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First Class Mail

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